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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/022,715

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Masahiro Kodama

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2113

7590

05/14/2004

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EXAMINER

EASTHOM, KARL D

ART UNIT

PAPER NUMBER

2832

DATE MAILED: 05/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/022,715

Applicant(s)

KODAMA ET AL.

Examiner

Karl D Easthom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/2/4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-17 are rejected under 35 U.S.C. 102(b) as anticipated by Kumada et al. or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kumada in view of Ogose, or Furukawa et al., or Kitsui et al. (JP200-106304) further in view of Quirk. Kumada discloses the claimed invention at Figs. 1, 4 and 5, with glass layer 25 on a surface, and electrodes 24, 21, 22, with barium titanate at col. 6. The glass layers 25 are impregnated where they are fired under pressure and temperature at col. 6, lines 48-60. That is, inherently the glass is impregnated since there is pressure and temperature, according to applicant's specification, and bonding would not occur where there is no diffusion. Adhesion requires an amount of diffusion. Also, Furukawa at col. 3 provides more evidence that diffusion occurs by sintering. The term about 90% is met since the barium titanate thermistors is a ceramic, and so cannot be a perfect crystal, and Niimi at par. 13 provides evidence that a perfect crystal lattice is required for theoretical density to be 100%. Hence, for conventional barium titanate thermistors, the density is about 90%,

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where the term “about” is broad, since conventional thermistors are not perfect crystals. As an alternative, Ogose discloses using glass diffusion on a multilayer barium titanate chip similar to that of Kumada in order to prevent moisture from penetrating into the sintered compact, so that it would have been obvious in view of Ogose to employ that density for the purpose of forming a PTC device having excellent characteristics as disclosed at par. 20 thereof, said density allowing glass to impregnate. Furukawa discloses a glass diffused covering 13 for thermistors in general at Fig. 3. Furukawa discloses that such a covering is needed to protect the chip at col. 1, lines 5-25. Similarly, Kitsui at the abstract discloses in general a chip thermistor such as that of Furukawa having diffused glass 7 on the thermistor surfaces to protect it. For claims 7, 12, no sintering agent is disclosed in Kumada. Alternatively, it would have been obvious in view of Ogose not to employ it where none is disclosed in either reference as a requirement, suggesting it is not required. Regarding claims 3, 6, 11, and 16-17, only the 103 rejection applies, as Kumada lacks the temperature of the softening point. Ogose discloses employing such a glass at par. 21 of the machine translation for the purpose of ensuring glass diffusion upon the sintered product. And as applicant admits, “the surface of ceramic electronic components is conventionally coated with a ...glass to form a protective layer in order to maintain moisture, heat or weather resistance” –page 7 of the 12/3/03 remarks. Ogose provides motivation by disclosing a glass coating for a barium titanate ceramic component to fill up the pores and to thus prevent humidity from entering and to prevent degradation.¹ As the 103 alternative to the theoretical density, Quirk discloses that the

¹It is well known that barium titanate capacitors and resistors or semiconductors

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density must be about 90%, less than 93%, or else there could be no diffusion into the pores, at col. 3, lines 35-45, so that it would have been obvious to employ such a density in order to allow diffusion to occur, and hence to protect the component.

4. Applicant's arguments filed 4/02/04 have been fully considered but they are not persuasive or are moot. Niimi is removed where applicant now states that the same entity owned the rights thereto and the invention. Applicant argues that Kumada fails to inherently disclose impregnation, or the density. Applicant argues that "impregnation" is not met merely by glass layers internal to the device; that is, some diffusion is required. This argument is accepted so that diffusion is required. To this it is noted that Applicant argued previously that impregnation requires more than surface diffusion, but this is not correct according to the normal use of the word, and such an argument is an admission that some diffusion occurs into the surface. As to the lack of inherency where the Examiner also alleged diffusion to meet impregnation, evidence is provided by such an admission, and also, evidence of diffusion occurs in Furukawa where heating and placing the glass on the surface creates diffusion. Similar evidence is in applicant's

differ only in that the barium site of the former is doped to obtain the latter, suggesting the compatibility of the two types of electronic devices. For evidence of this - see col. 1, lines 23-31 of Sasaki et al, or see Purdes et al. at col. 1. Further, it is well known that pores are filled in order to coat resistors, see Bockstie, Jr. at col. 1, lines 40-50, and that a certain porosity must be present, which means that the density must be low enough, in order to fill the pores, see Quirk at col. 3, lines 35-45. Added motivation is here supplied from the prior art of record.

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disclosure. Applicant points out that 100 degrees heating would not produce diffusion, but there is disclosed heating at 800 degrees in Kumada to obtain a laminate at the top of col. 7. Also, the pressure and heat is exerted on a paste, not a ceramic. All layers are in a paste form, and heated under pressure and heat to form the ceramic laminate, so that it would be impossible not to have diffusion when two pastes are pressed together.

Moreover, adhesion requires an amount of diffusion and is evidence thereof. As to the argument that "about 90 percent" density is not supported by the fact that the ceramic green sheets are not perfect crystals, this is not correct. Theoretical density is compared to a perfect crystal as Niimi discloses. Hence "about 90%" means less than a perfect crystal. The term "about" is broad, and Quirk provides evidence that no diffusion occurs above 93 percent.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl D Easthom whose telephone number is (571) 272-1989. The examiner can normally be reached on M-Th, 5:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karl D Easthom
Primary Examiner
Art Unit 2832

KDE